



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/749,309 | 12/27/2000 | Jeffrey C. Buchholz | 728 | 6126 |

7590 01/26/2004
Donald J. Ersler
725 Garvens Avenue
Brookfield, WI 53005

EXAMINER

BELLO, AGUSTIN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2633

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,309

Applicant(s)

BUCHHOLZ, JEFFREY C.

Examiner

Agustin Bello

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 14-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant claims "another surface" of an "optical delivery device." However, the "optical delivery device," in this case the optical fiber, appears to have only a single surface. It appears that the applicant intended to recite "another surface" of said "optical beam steering device." Correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 and 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Edelman (U.S. Patent No. 4,503,564).

Regarding claims 1 and 8, Edelman teaches an optically actuated transducer system comprising: a light emitter (column 2 line 53); a light emitter driver circuit (inherent) receiving an audio signal, said light emitter driver circuit modulating current (column 2 lines 49-50) to said light emitter; a speaker membrane (reference numeral 20 in Figure 3); an absorber layer (reference numeral 29 in Figure 3) being applied to said speaker membrane; and an optical

Art Unit: 2633

delivery device (reference numeral 26 in Figure 3) receiving light from said light emitter on one end, the other end of said optical delivery device contacting said absorber layer, said absorber layer converting the light to heat (column 2 lines 36-39), the absorber layer experiencing a thermal expansion (column 2 lines 36-39), the thermal expansion causing the speaker membrane to make linear motion and produce an acoustic output (e.g. "Audio" in Figure 3).

Regarding claims 2 and 9, Edelman teaches the optically actuated transducer system of claim 1, wherein: said optical delivery device being positioned such that the angle between a face of said speaker membrane and said optical delivery device is substantially perpendicular (as seen in Figure 3).

Regarding claim 3, Edelman teaches the optically actuated transducer system of claim 2, wherein: said optical delivery device being a fiber optic cable (column 2 line 45).

Regarding claims 4 and 10, Edelman teaches the optically actuated transducer system of claim 1, further comprising: a periphery of said speaker membrane being attached to a mounting ring (reference numeral 14, 22 in Figure 1), said mounting ring being attached to a transducer compartment (reference numeral 23, 24 in Figure 1), said transducer compartment retaining said optical delivery device (reference numeral 28 in Figure 1).

Regarding claims 5 and 11, Edelman teaches the optically actuated transducer system of claim 1, wherein: said speaker membrane being fabricated from a polymer plastic (column 3 lines 2-3).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2633

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6, 7, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edelman.

Regarding claims 6, 7, 12, and 13, Edelman teaches the optically actuated transducer system of claim 1, but differs from the claimed invention in that Edelman fails to specifically teach that the absorber layer is fabricated from a nickel foil or gallium arsenide. However, Edelman teaches that the absorber layer can be fabricated from metals, metal alloys, glasses, or composites (column 3 lines 6-7). One skilled in the art would clearly have recognized that nickel foil, a metal, or gallium arsenide, a glass, could have been used to form the absorber layer of Edelman. One skilled in the art would have been motivated to use either nickel foil or gallium arsenide to form the absorber layer of Edelman since both materials are readily available and each provide unique degrees of absorption. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to fabricate the absorber layer from nickel foil or gallium arsenide.

7. Claims 14-21, as best understood by the examiner in view of the 112 rejections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Edelman in view of Fulenwider (U.S. Patent No. 4,016,556).

Regarding claim 14, Edelman teaches an optically actuated transducer system comprising: a light emitter (column 2 line 53); a light emitter driver circuit (inherent) receiving an audio signal, said light emitter driver circuit modulating current (column 2 lines 49-50) to said light emitter; a speaker membrane (reference numeral 20 in Figure 3); an absorber layer

Art Unit: 2633

(reference numeral 29 in Figure 3) being applied to said speaker membrane; an optical delivery device (reference numeral 26 in Figure 3) receiving light from said light emitter on one end; said absorber layer converting the light to heat (column 2 lines 36-39), the absorber layer experiencing a thermal expansion (column 2 lines 36-39), the thermal expansion causing the speaker membrane to make linear motion and produce an acoustic output (e.g. "Audio" in Figure 3). Edelman differs from the claimed invention in that Edelman fails to specifically teach and an optical beam steering system receiving light on one surface from said optical delivery device and reflecting said light at a different angle, another surface of said optical delivery device contacting said absorber layer of the diaphragm. However, such beam steering devices are well known in the art. Fulenwider, in the same field of endeavor, discloses an optical beam steering system receiving light on one surface (reference numeral 38 in Figure 2) from said optical delivery device and reflecting said light at a different angle (as seen in Figure 2), another surface (column 3 lines 29-32) of said optical delivery device contacting the diaphragm. One skilled in the art would clearly have recognized from the disclosure of Fulenwider that it would have been possible to reflect a light beam from a reflecting surface onto the absorption layer of Edelman. One skilled in the art would have been motivated to modify the teachings of Edelman according to the disclosure of Fulenwider in order to create a more compact optically actuated transducer since the configuration disclosed by Fulenwider would have allowed the fiber of Edelman to couple to the absorbing layer of Edelman in a parallel manner. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Edelman according to the disclosure of Fulenwider.

Art Unit: 2633

Regarding claim 15, although the combination of references fails to specifically teach ball lenses, a prism reflector and the effects they provide on light, such devices and their functions are very common in the art and would have been obvious to one skilled in the art at the time the invention was made.

Regarding claim 16, the combination of references suggests that said optical delivery device (reference numeral 26 in Figure 3 of Edelman) could be positioned such that the angle between a face of said speaker membrane (reference numeral 20 in Figure 3 of Edelman and reference numeral 36 in Figure 2 of Fulenwider) and said optical delivery device is substantially parallel (as suggested by Fulenwider in Figure 2).

Regarding claim 17, Edelman teaches said optical delivery device being a fiber optic cable (column 2 line 45).

Regarding claim 18, Edelman teaches a periphery of said speaker membrane being attached to a mounting ring (reference numeral 14, 22 in Figure 1), said mounting ring being attached to a transducer compartment (reference numeral 23, 24 in Figure 1), said transducer compartment retaining said optical delivery device (reference numeral 28 in Figure 1).

Regarding claim 19, Edelman teaches the optically actuated transducer system of claim 1, wherein: said speaker membrane being fabricated from a polymer plastic (column 3 lines 2-3).

Regarding claims 20 and 21, the combination of references differs from the claimed invention in that it fails to specifically teach that the absorber layer is fabricated from a nickel foil or gallium arsenide. However, Edelman teaches that the absorber layer can be fabricated from metals, metal alloys, glasses, or composites (column 3 lines 6-7). One skilled in the art would clearly have recognized that nickel foil, a metal, or gallium arsenide, a glass, could have

Art Unit: 2633

been used to form the absorber layer of Edelman. One skilled in the art would have been motivated to use either nickel foil or gallium arsenide to form the absorber layer of Edelman since both materials are readily available and each provide unique degrees of absorption. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to fabricate the absorber layer from nickel foil or gallium arsenide.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Feldman and Edelman teach relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600